



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,436	09/17/2003	Teruo Fujii	15162/06180	4519
24367	7590	07/03/2007	EXAMINER	
SIDLEY AUSTIN LLP 717 NORTH HARWOOD SUITE 3400 DALLAS, TX 75201			HYUN, PAUL SANG HWA	
			ART UNIT	PAPER NUMBER
			1743	
			MAIL DATE	DELIVERY MODE
			07/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/664,436

Applicant(s)

FUJII ET AL.

Examiner

Paul S. Hyun

Art Unit

1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

REMARKS

Claims 1-19 are currently pending. In response to the Office action dated 1/3/07, Applicants amended claims 1, 4, 6, 9, 10, 13 and 15, and added new claim 19.

The claim rejections under 35 U.S.C. section 112 cited in the previous Office action have been withdrawn in light of the amendments.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not

Art Unit: 1743

commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims **1, 2, 4, 5, 10, 11, 13-16, 18 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouellet et al. in view of Zanzucchi et al. (US 5,846,396) and O'Connor et al. (US 2002/0124896 A1).

Ouellet et al. disclose a microfluidic apparatus (see Fig. 1). As shown from top to bottom in Figure 1, the apparatus comprises a channel unit 132, and a pump unit comprising two layers (a sheet-like member and a pump portion) that are positioned with respect to each other by a bonding means (see lines 55-60, col. 3). The channel unit 132 comprises a second joint surface 116, and a plurality of second channel openings to the second joint surface 116. The sheet-like member of the pump unit comprises a first joint surface in contact with the second joint surface 116 of the channel unit 132, a plurality of through-holes, and a channel network etched onto the surface of the first joint surface such that both ends of the channel network are open to the first joint surface. The pump portion of the pump unit is attached to the bottom of the sheet-like member. The reference further discloses that each unit can be made from PDMS (see line 40, col. 3), and it is well-known in the art to incorporate micropumps in such devices (see line 22, col. 12).

The device disclosed by Ouellet et al. differs from the claimed invention in that Ouellet et al. do not explicitly disclose the location of a pumping mechanism relative to the device. Ouellet et al. also do not disclose that the units are detachably joined.

Art Unit: 1743

With respect to the location of the pumping mechanism, Zanzucchi et al. disclose a micropump for facilitating the movement of fluid within a microfluidic channel wherein the micropump is disposed within the channel (see claim 19). In light of the disclosure of Zanzucchi et al., it would have been obvious to one of ordinary skill in the art to position the micropump disclosed by Ouellet et al. within the network of channels to optimize the pumping ability of the micropump.

With respect to the detachable joining of the units, O'Connor et al. disclose a microfluidic device constructed from layers of substrates. The layers are bonded to one another by means of a removable adhesive (see [0056]). In light of the disclosure of O'Connor et al., it would have been obvious to one of ordinary skill in the art to bond the layers of the device disclosed by Ouellet et al. using removable adhesive so that the device can be disassembled for cleaning.

Claims **3, 12 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouellet et al. in view of Zanzucchi et al. and O'Connor et al. as applied to claims 1, 2, 4, 5, 10, 11, 13-16, 18 and 19, and further evidenced by Wikipedia.

Neither Ouellet et al., Zanzucchi et al., nor O'Connor et al. explicitly disclose that PDMS is translucent. However, Wikipedia discloses that PDMS is optically clear.

Claims **6, 7 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouellet et al. in view of Zanzucchi et al.

Ouellet et al. disclose a microfluidic apparatus (see Fig. 1). As shown from top to bottom in Figure 1, the apparatus comprises a channel unit 132, a sheet-like member, and a pump unit that are positioned with respect to each other by a bonding means (see lines 55-60, col. 3). The channel unit 132 comprises a second joint surface 116, and a plurality of second channel openings to the second joint surface 116. The sheet-like member comprises a fourth joint surface in contact with the second joint surface 116, a third joint surface opposite the fourth joint surface, and a plurality of through-holes in fluid communication with the second channel openings of the channel unit. Lastly, the device comprises a pump unit comprising a first joint surface in contact with the third joint surface of the sheet-like member, and a channel network etched onto the surface of the first joint surface such that both ends of the channel network are open to the first joint surface. The reference further discloses that each unit can be made from PDMS (see line 40, col. 3), and it is well-known in the art to incorporate micropumps in such devices (see line 22, col. 12).

The device disclosed by Ouellet et al. differs from the claimed invention in that Ouellet et al. do not explicitly disclose the location of a micropump relative to the device.

Zanzucchi et al. disclose a micropump for facilitating the movement of fluid within a microfluidic channel wherein the micropump is disposed within the channel (see claim 19). In light of the disclosure of Zanzucchi et al., it would have been obvious to one of ordinary skill in the art to position the micropump disclosed by Ouellet et al. within the channel to optimize the pumping ability of the micropump.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouellet et al. in view of Zanzucchi et al. as evidenced by Wikipedia.

Neither Ouellet et al. nor Zanzucchi et al. explicitly disclose that PDMS is translucent. However, Wikipedia discloses that PDMS is optically clear.

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new grounds of rejection. The amended claims further limit the location of the pump mechanism relative to the channel unit. The amended claims also specify that opposing ends of the claimed channel open to the claimed first joint surface. The amendments changed the scope of the claims and necessitated new grounds of rejections. It is believed that the new grounds of rejections address Applicants' arguments.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 1743


extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul S. Hyun whose telephone number is (571)-272-8559. The examiner can normally be reached on Monday-Friday 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PSH
6/26/07


Jill Warden
Supervisory Patent Examiner
Technology Center 1700